SPIder Plenary Session

“Organisational aspects of a European collaboration project”

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Vragen

- Waarom zijn er samenwerkingsverbanden tussen Europese organisaties?
- Wat is het doel ervan?
- Hoe komt een project tot stand?
- Hoe is subsidie geregeld in Nederland?
- Zijn deze projecten alleen bedoeld voor grote organisaties of zitten er juist veel voordelen aan voor kleine bedrijven of instellingen?
- Staan de inspanningen of investeringen wel in verhouding tot de opbrengsten?

MOOSE Consortium

Finland		
– Nokia		Application partner
– Solid		Application partner
– VTT Electronics		Technology and exploitation partner
– Oulu University		Technology partner
Netherlands		
– LogicaCMG		Application and exploitation partner
– Philips		Technology and application partner
– Océ		Application partner
– Delft University		Technology partner
– ASML		Application partner
Spain		
– SQS		Technology partner
– ESI		Technology and exploitation partner
– Datapixel		Application partner
– Team Arteche		Application partner

MOOSE Project Objectives

1. Develop framework for the integration of software engineering technologies for embedded systems
2. Develop new or enhance existing software engineering technologies to fit in this framework
3. Validation of the MOOSE results in industrial projects

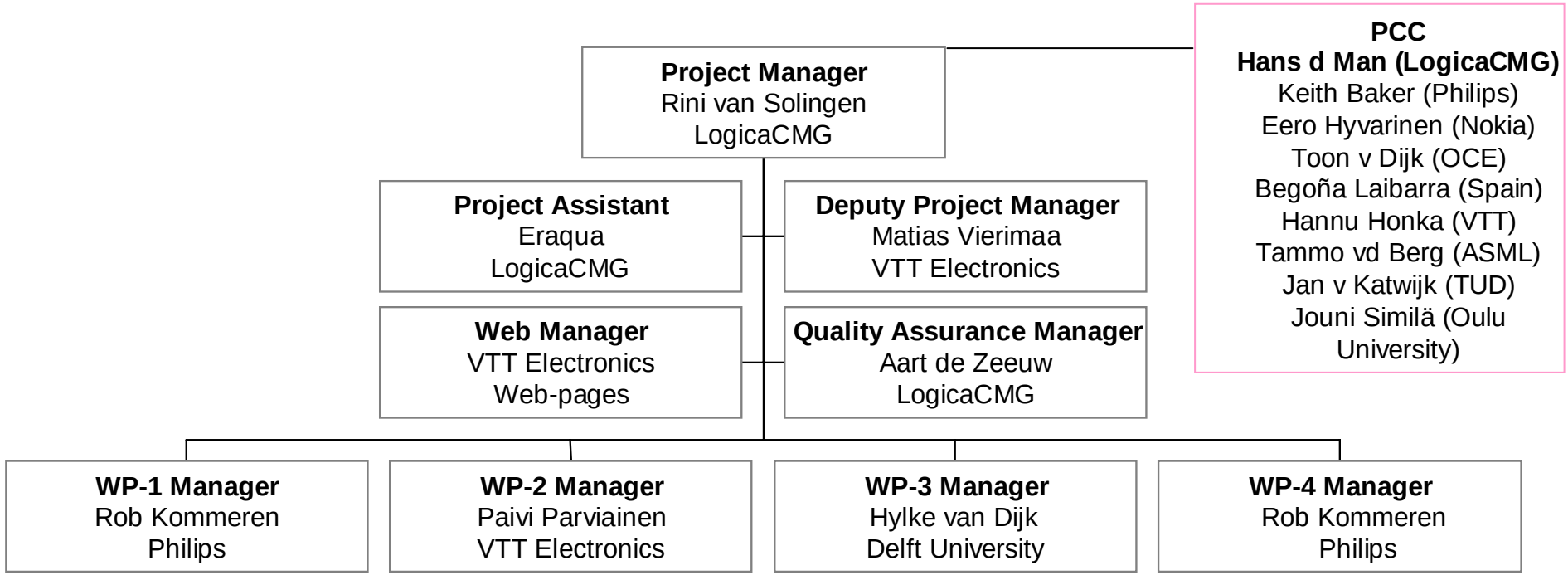
MOOSE Work packages

- WP1: Framework Development and Validation
- WP2: Systems & Software Req. Engineering
- WP3: Embedded Product Architectures
- WP4: Improvement Management

Project phases

- Inventory
  - Industrial
  - Literature
- SWOT analysis
  - Define required technological developments
  - Find matching between technologies and industrial cases
- Development
  - Enhance existing or develop new technologies
- Cases
  - Validate technology by solving concrete practical issue
  - Discover deployment challenges and possible solutions
- Dissemination and exploitation

Project Organisation



Overall Project Activities

- Plenary Project Meetings
  - Bilbao 5-6.06.2003
  - Venlo 15-16.09.2003
  - Tenerife 20-21.11.2003
  - Bilbao 19-20.02.2004
  - Delft 19-20.04.2004
  - Helsinki 9-11.06.2004
  - Hoofddorp 30.08.2004
- PCC Meetings
  - Helsinki 12.09.2002
  - Rotterdam 25.03.2003
  - Leuven 09.10.2003
  - Helsinki 10.06.2004

- Hoofddorp 30.11.2001
- Bilbao 25-27.03.2002
- Barcelona 29-31.05.2002
- Saariselkä 9-10.09.2002
- Rovaniemi 11-13.12.2002
- Eindhoven 6-7.02.2003
- Rotterdam 24-25.03.2003

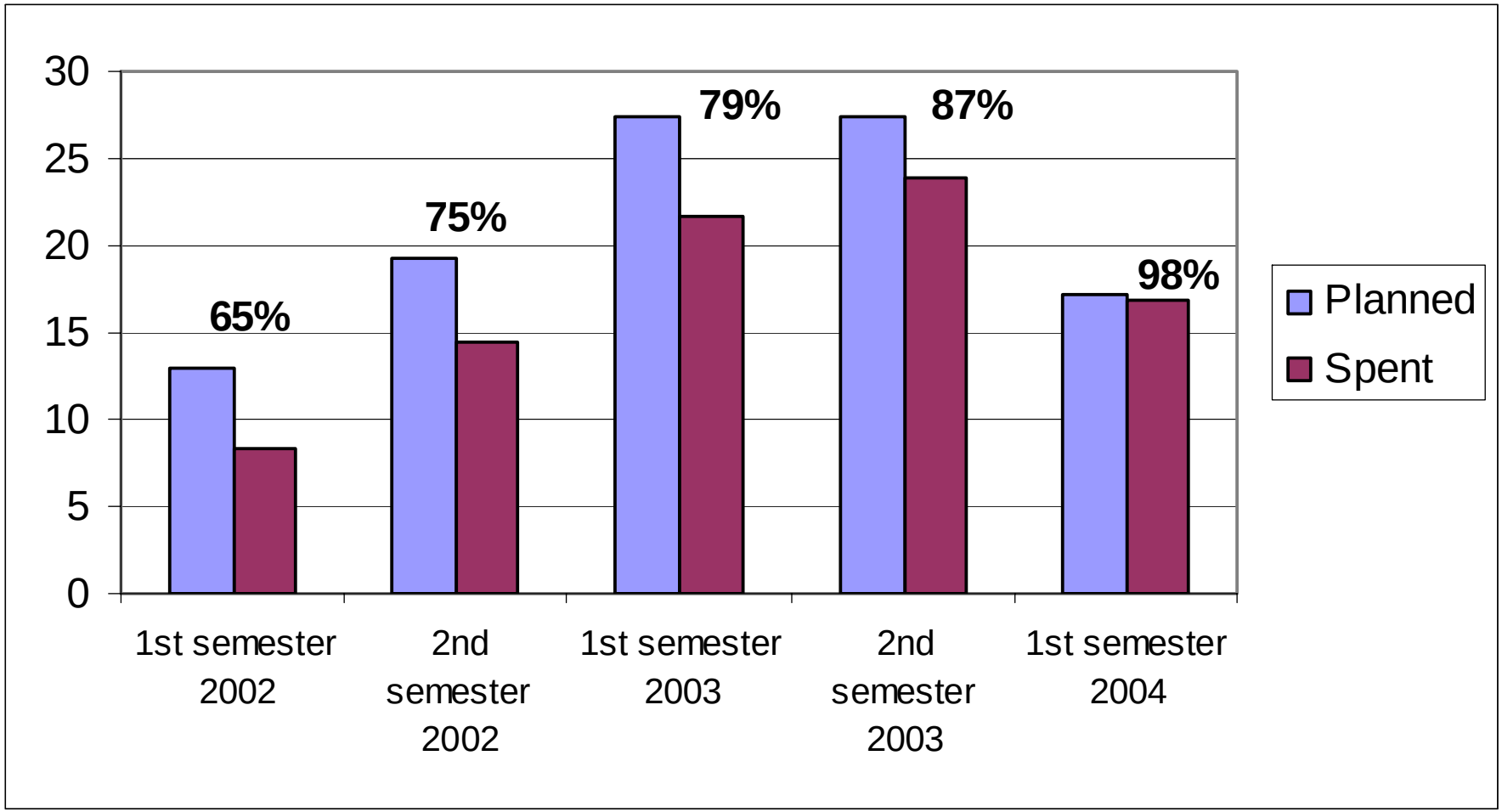
Project Results

- Deliverables
  - 138 deliverables/reports produced according to plan
  - Web-repository up and running containing 100 project experiences
  - Asset-box containing 40 different MOOSE assets
- Collaboration
  - Strong collaboration among partners: joint project
  - Satisfied industrial partners with impact of the industrial cases and deployment of results
  - Industrial partners were in leading/steering position
  - Collaboration resulted in second ITEA project: Merlin

Project Issues

- Funding
  - Funding Spanish partners ended 2003, decreasing Spanish participation in last period of the project
- Effort
  - 81% of effort spent compared to planned
  - Mainly caused by reduced efforts of 2 partners
- Project Management
  - Several changes in WP leadership for various reasons, with in the end limited impact

Effort

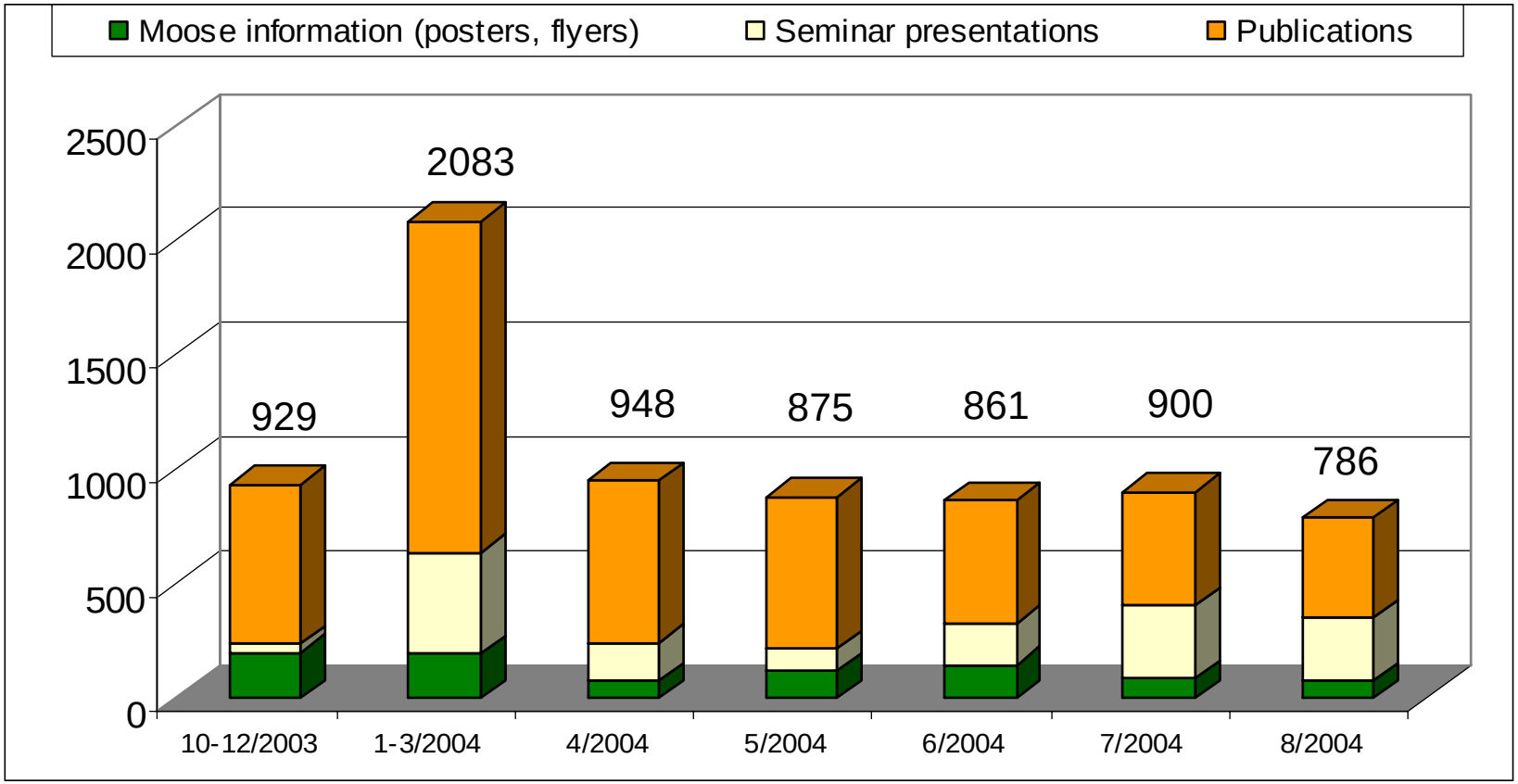

30
25
20
15
10
5
0
65%
75%
79%
87%
98%
1st semester 2002
2nd semester 2002
1st semester 2003
2nd semester 2003
1st semester 2004
Planned
Spent

ITEA collaboration

- Intense collaboration with EMPRESS project
  - Shared meetings and workshop
  - Joint method development in WP4
- Two industrial seminar open to other ITEA projects
  - Other ITEA projects visited the seminar
- Moose findings and web-repository useful for other ITEA projects too
  - Opportunities for more intense ITEA internal dissemination are open for consortium
  - Internal pages could work as template too
  - Contacts with TT-Medal, Agile, Candela, and Families

Document downloads

- Total number of downloads: 7382



Most downloaded documents

814, Requirements engineering: Inventory of technologies, Parviainen et al

768, Software configuration management in agile methods, Koskela

530, Moose seminar presentation (Parviainen), Requirements engineering technologies

454, COTS Evaluation Using Desmet Methodology & Analytic Hierarchy Process (AHP), Morera

437, Moose poster; 325, Moose flyer;

436, Experiences&Lessons Learned Using UML-RT to Develop Embedded Printer SW, Dohmen&Somers

270, Integrating Software Engineering Technologies for Embedded Systems Development, van Solingen

276, Performance analysis at the software architectural level, Kauppi

247, Moose seminar keynote (van Solingen), Minimal change, maximal result

214, Requirements implementation in embedded software development, Jäälinoja

199, Analyzing Performance of Concurrent Usage Scenarios Using SW Arch. Analysis, Kauppi&Purhonen

196, Software Technologies for Embedded Systems: An Industrial Inventory, Graaf, Lormans, Toetenel

171, The Dimensions of Embedded COTS and OSS Software Component Integration, Helokunnas.

168, Supporting RE in XP,:managing user stories, Kääriäinen et al

156, Moose seminar presentation (Ojala), Value engineering

153, Wireless Games - Review and Experiment, Bendas&Myllyaho

128, Agile requirements engineering: building tool support for XP, Kolehmainen

121, A Framework for Off-The-Shelf Software Component Development and Maintenance Process, Mäntyniemi et al

115, Measuring the ROI of Software Process Improvement, van Solingen

113, Mobile Application Architectures, Alatalo, Järvenoja, Keronen, Kuvaja

108, Architecture evaluation strategy for DSP software development, Purhonen

101, Web repository flyer

Project Summary

- Project finished according to plan
  - 138 deliverables finalised
  - 21 industrial cases run successfully
  - Web-repository with >100 industrial project data
  - Asset-box with 40 assets
  - 62 publications so far of which 4 in major journals
  - More than 7.000 downloads of Moose public deliverables
- Successful collaboration established
  - Positive feedback from all industrial partners
  - Frequent meetings and experience exchange

Vragen

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Subsidie / RoI

- Subsidie
  - Europese Coordinatie en inhoudelijke beoordeling via ITEA
  - Nationale subsidie via Senter/Novem – TS Internationaal
    - Tegenwoordig: IS-regeling – 2 Eureka tenders in 2005
  - Subsidie:
    - 50% van de bruto salariskosten incl. lasten
    - 35% van buitenlandse reis- en verblijfkosten
    - Subsidie voor pre-concurrentiele en niet-management kosten
- RoI
  - Positief door samenwerking en toegang tot resultaten van anderen
  - Financieel blijft het een investering, echter subsidie helpt wel
  - Matching met geplande activiteiten en projecten maakt rendabel

Moose
Software Engineering MethOdOlogieS for Embedded Systems

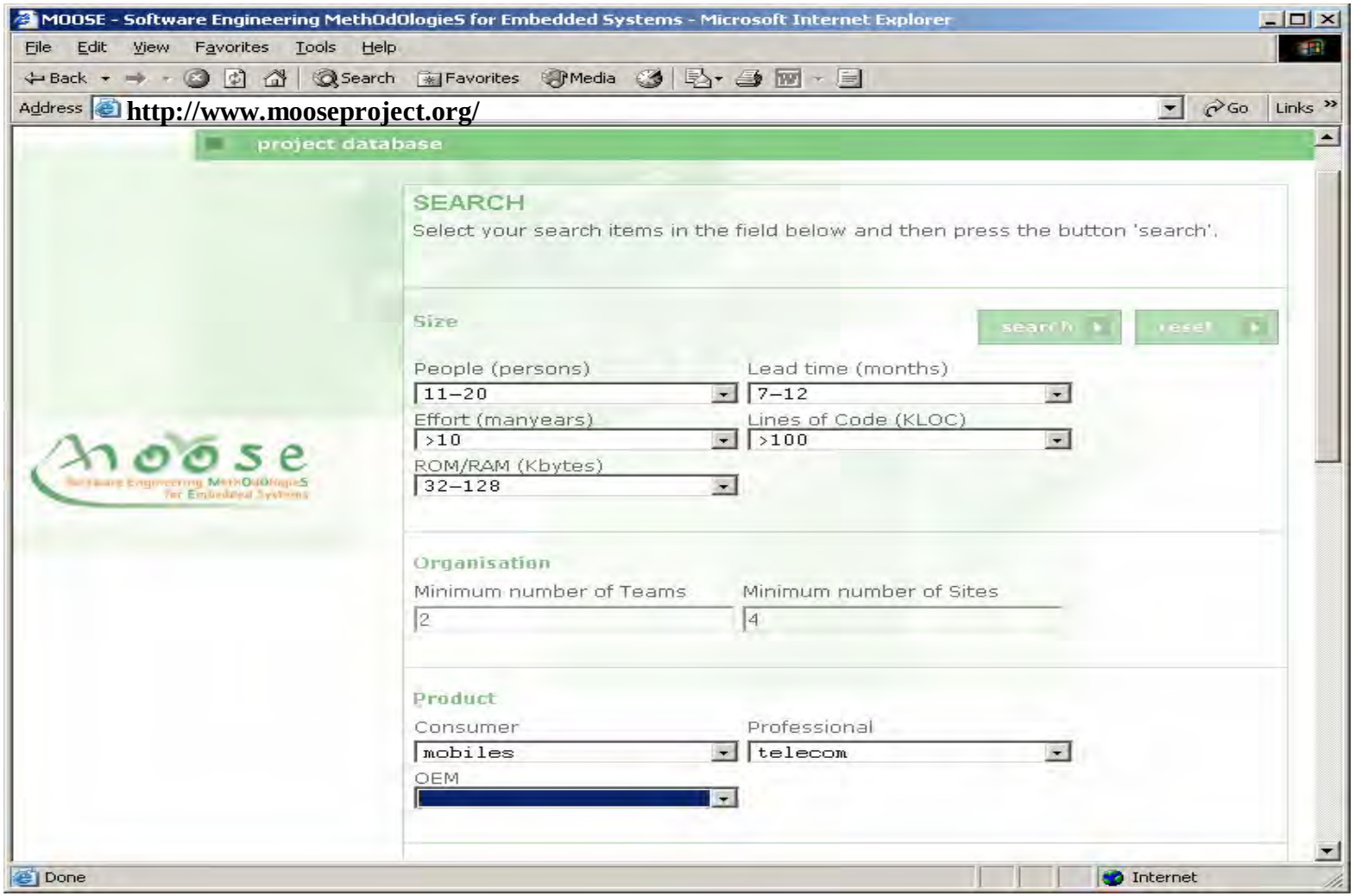
logicaCMG
solutions that matter

European usage of SE Technologies

Industrial Innovation needs Deployment

- Innovation = New Technology + Application
- Moose Inventory revealed:
  - Many Methods and Tools available
  - Industry tells: No More Methods and Tools
- Main challenge for innovation lies in deployment:
  - Maturisation of existing technologies
  - Evaluation of existing technologies
  - Experience collection for existing technologies
  - Integration to other existing technologies
- Industrial deployment is not easy: support is needed
  - Support in the selection of technologies that fit
  - Support in getting access to technology experiences from industrial practice

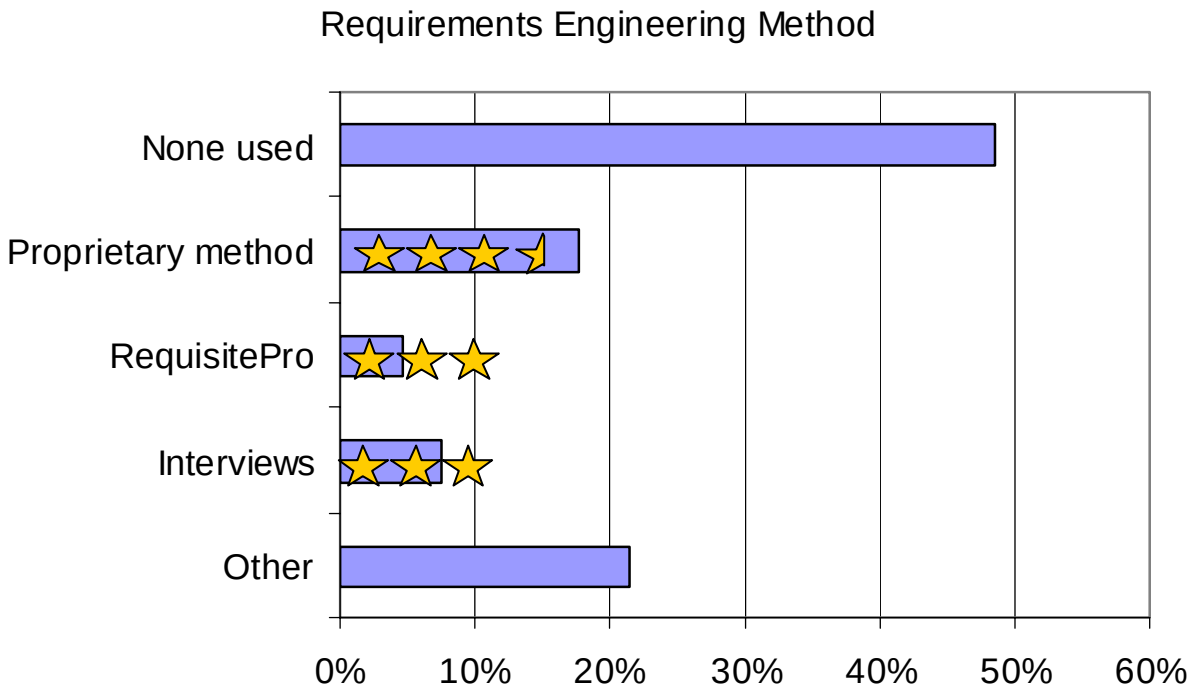
Web repository – contents (1)



Web repository – contents (2)

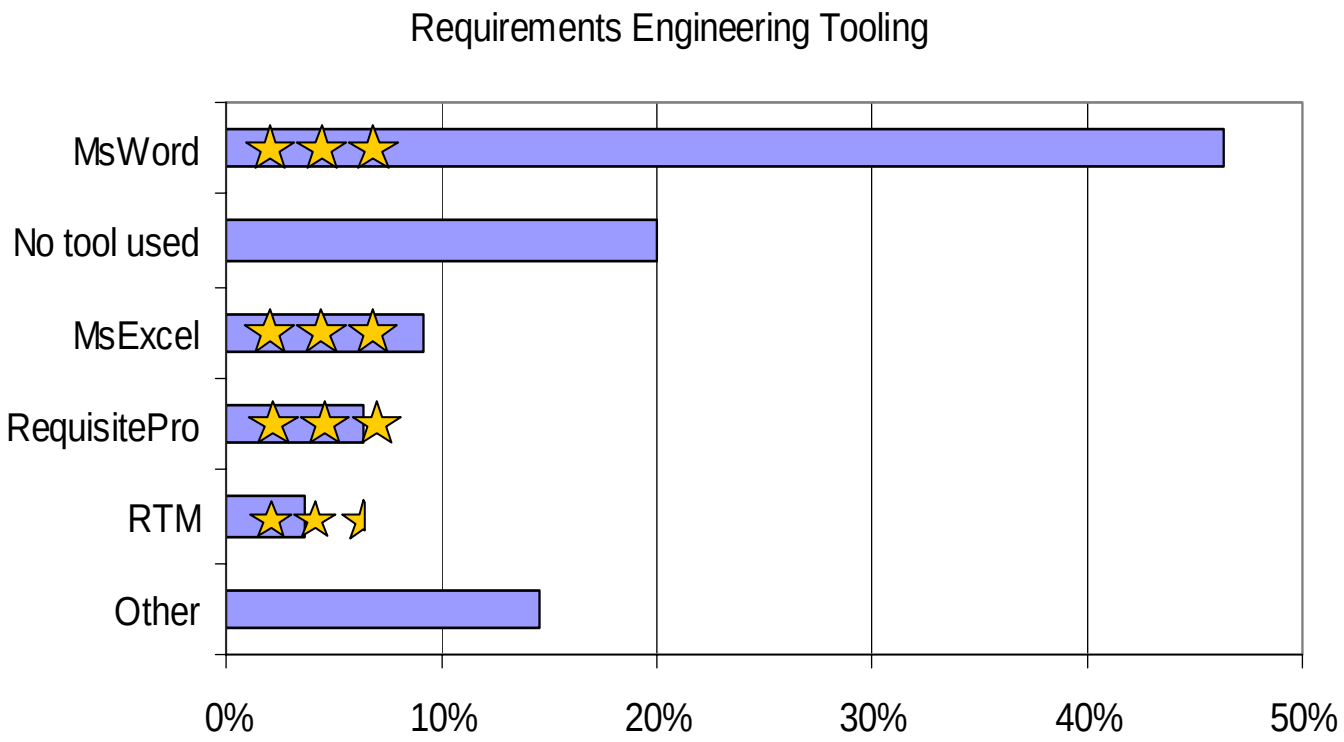
- Project centred storage and exchange of experiences
- Project characterisation
  - Effort, persons, lead-time, business driver, etc.
- Product characterisation
  - Software, Hardware, Real-time criticality, Market
- Technology characterisation
  - SE technology used
  - Satisfaction with the technology for that project
  - (☆☆☆☆☆ scale)
  - Short textual reason for this satisfaction rating
- Project evaluation report
  - Optional attachment with detailed findings and experiences
- Contact information

Technology Characterization: Which RE Methods are used?



1/2 of the products are developed without use of a RE method

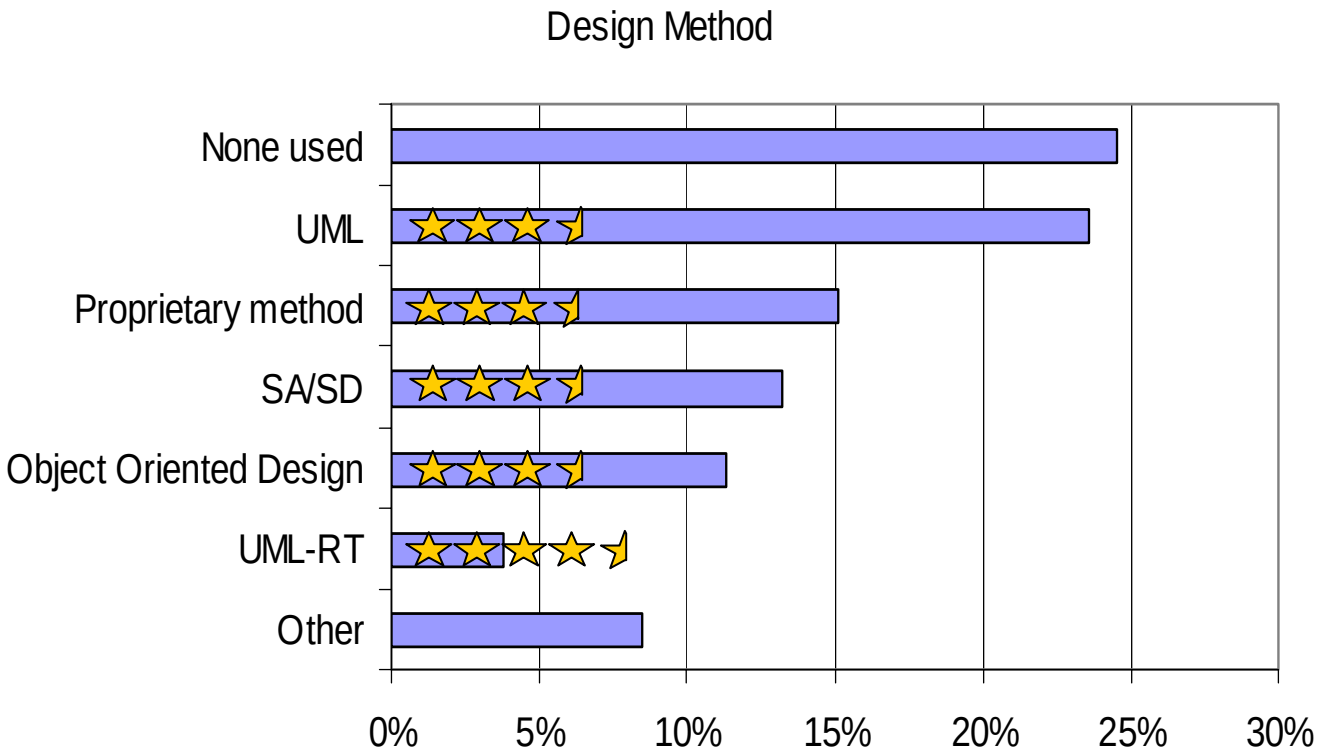
Technology Characterization: Which Requirements Engineering Tools are used?



25% use dedicated RE tools

The rest in fact does not use a tool at all

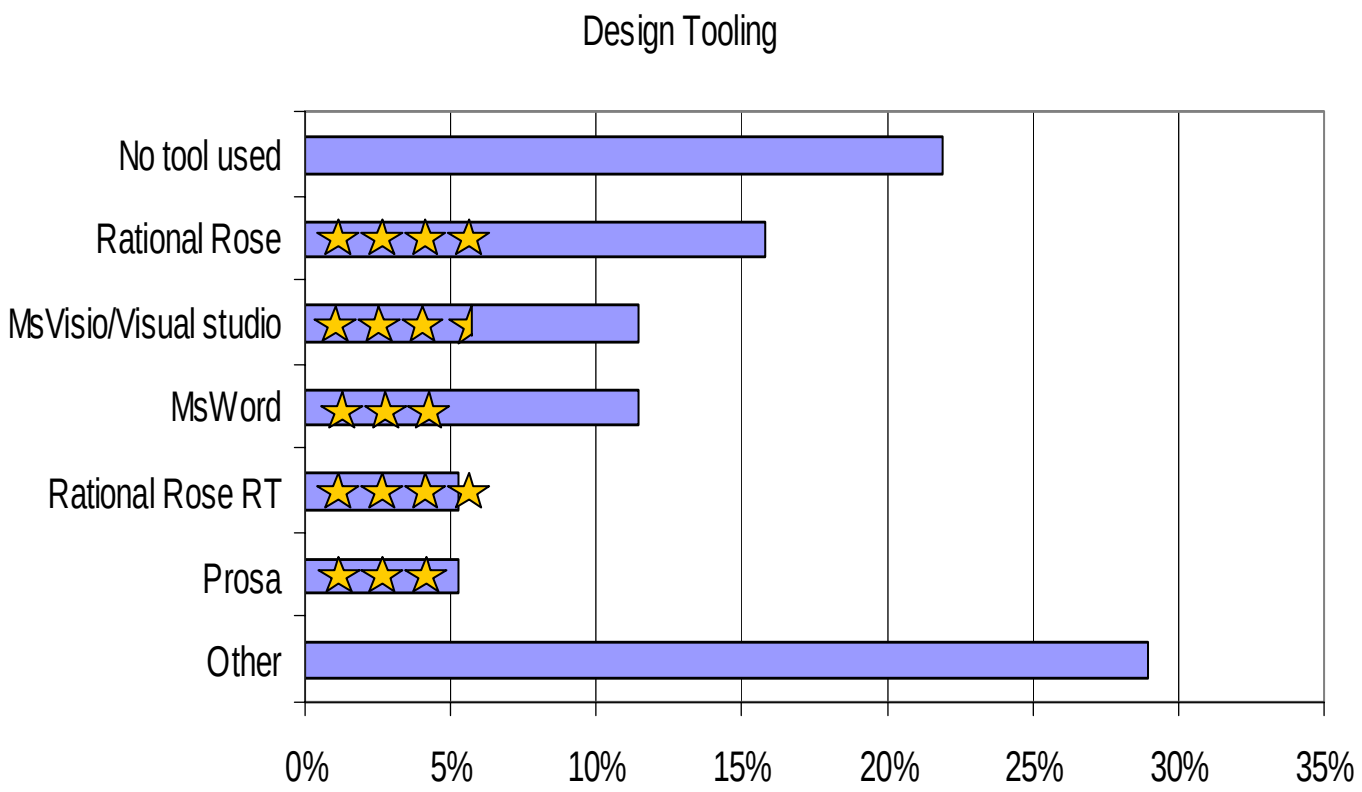
Technology Characterization: Which Design Methods are used?



25% of the products is designed without use of a method

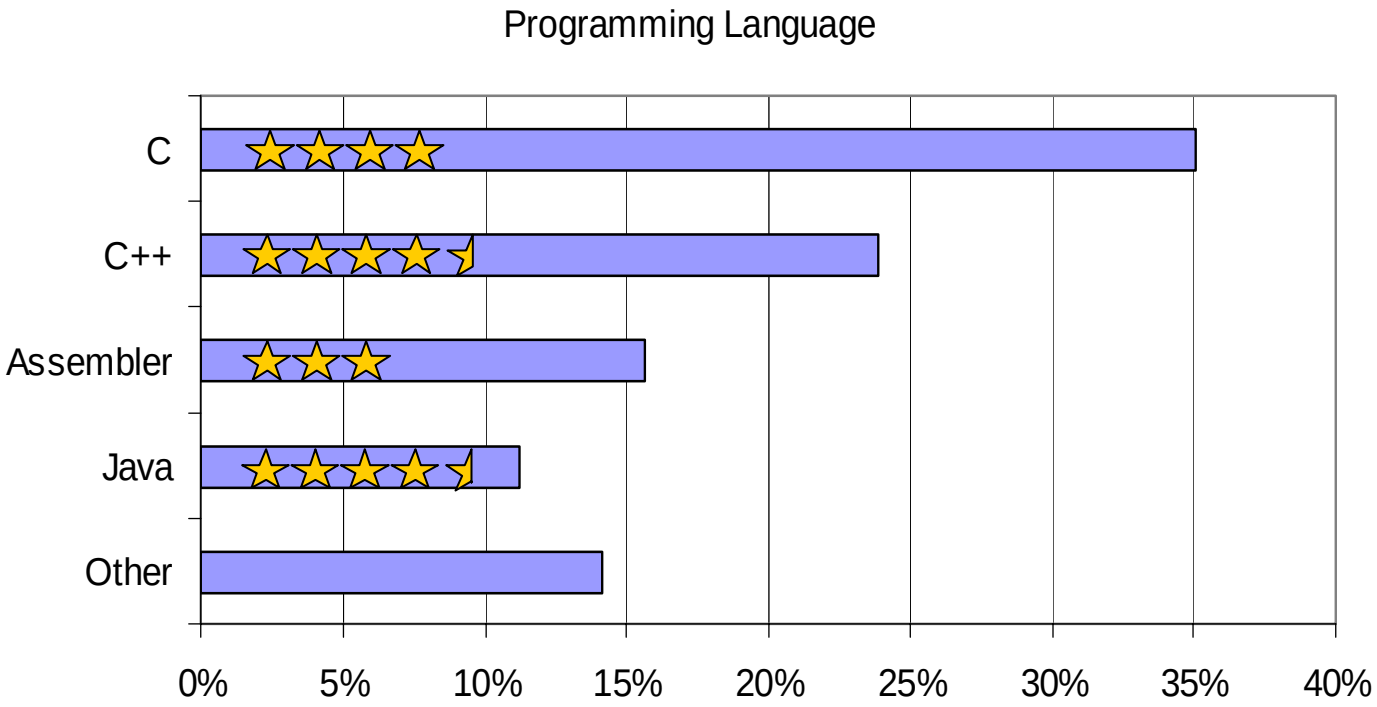
25% by use of UML

Technology Characterization: Which Design Tools are used?



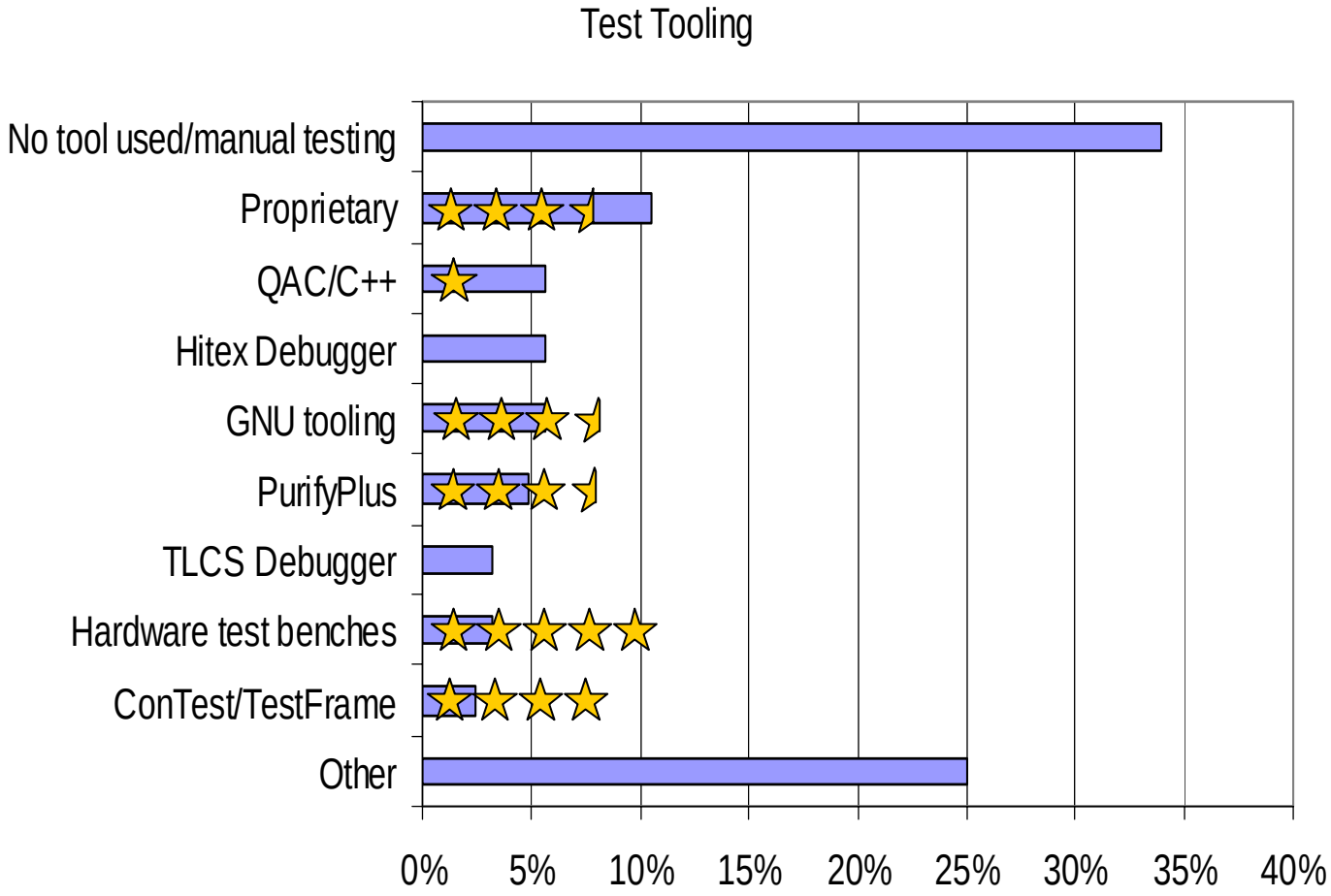
1/2 of the products is designed by using a generic drawing tool or no tool at all

Technology Characterization: Which Programming Languages are used?



60% of the products is made in C / C++

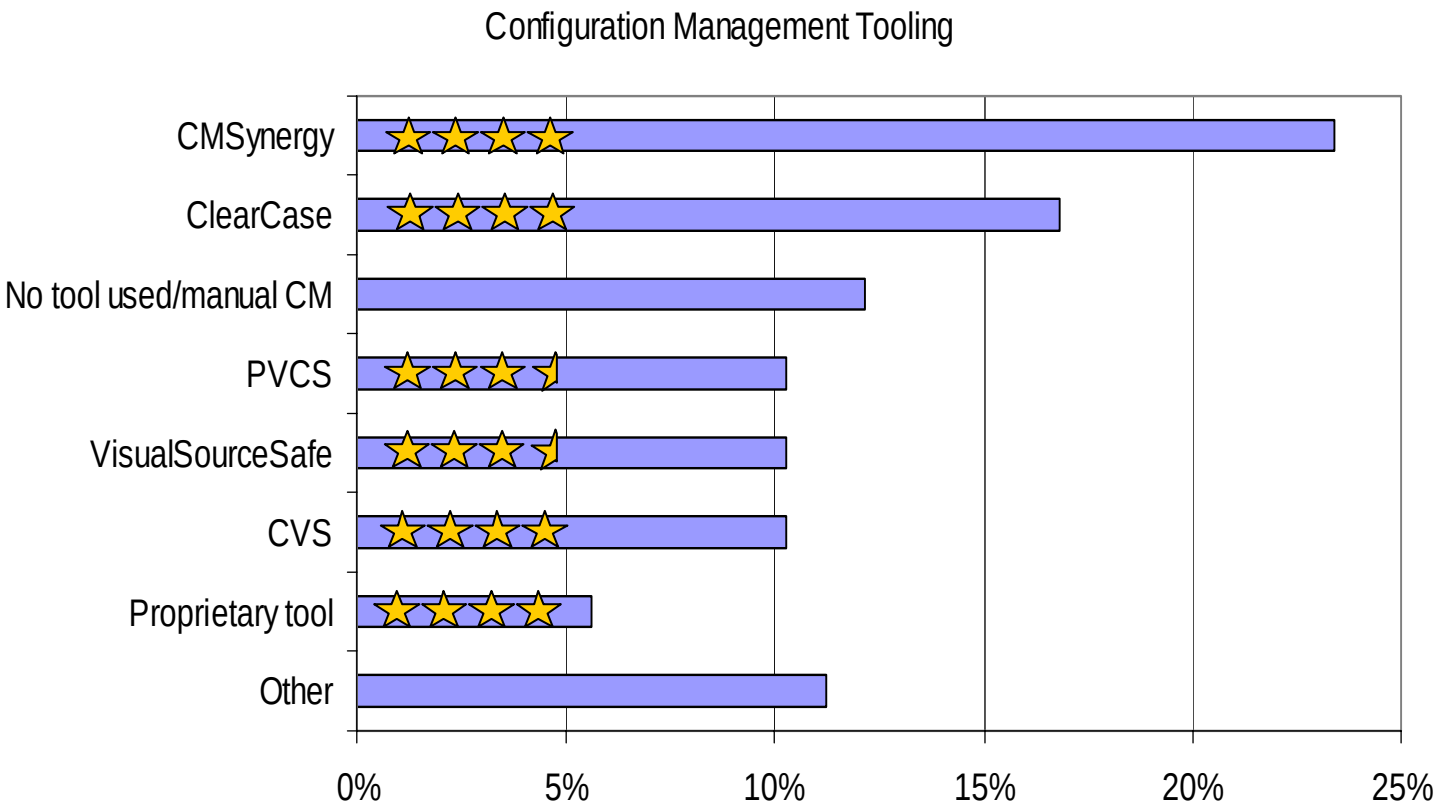
Technology Characterization: Which Test Tools are used?



1/3 of the products is manually tested

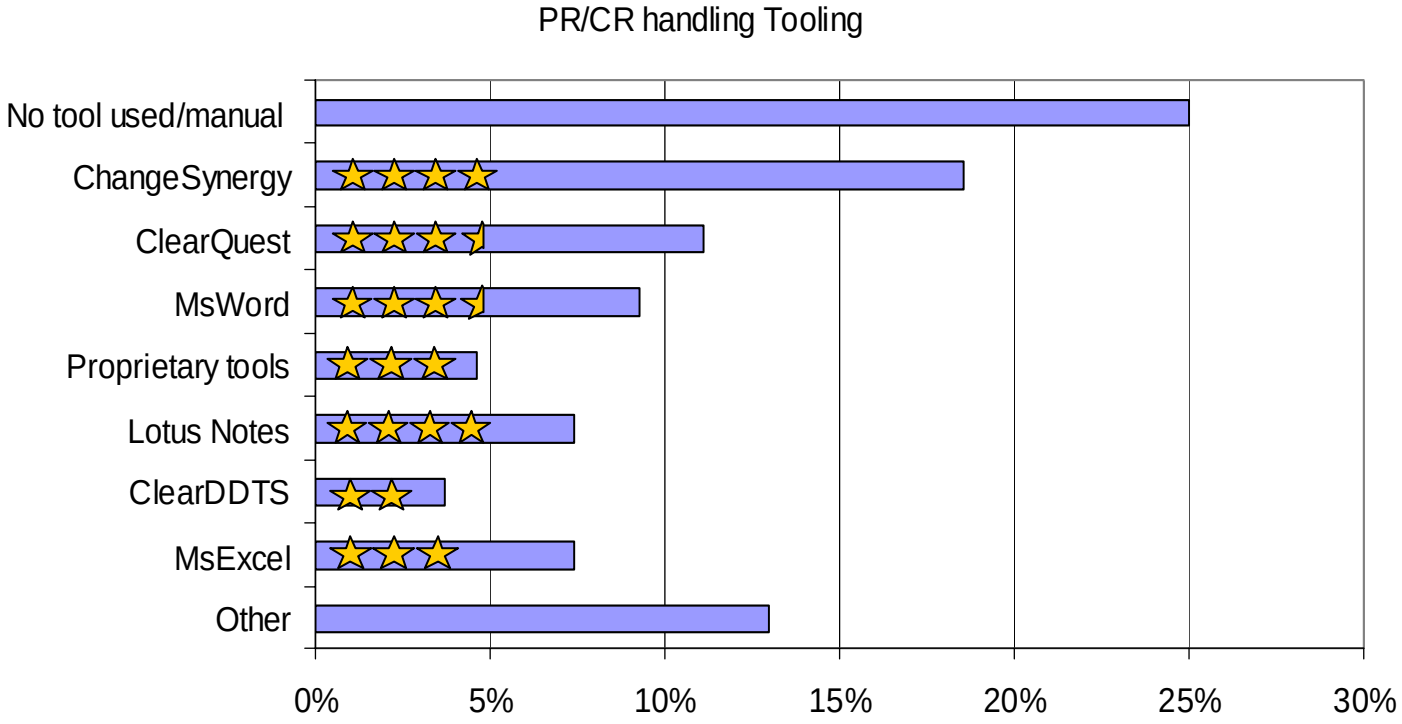
Enormous diversification in tools used

Technology Characterization: Which Configuration Management Tools are used?



90% of the products is developed using a CM tool

Technology Characterization: Which PR/CR handling tools are used?



30% of the projects use a PR/CR tool

25% use no tool

25% use a generic tool

Project and Product Characterization

- Project characterization
  - 75% of the projects is driven by schedule or functionality demands
  - 65% of the projects is undertaken on 1 site with max. 2 teams
  - 60% of the projects has a duration of <1 year
  - 80% of the projects has a duration of <2 years
  - 50% of the projects costs less than 5 person years, 5% cost 50+ py
- Product characterization
  - 50% of the products is for the professional or OEM market
  - 50% of the products has soft or no real time constraints
  - 60% of the products has more than 100.000 lines of software code
  - 30% of the products has memory boundaries below 1 Mbyte
  - 1/3 of the products has an MsWindows operating system
  - 1/3 of the products is Intel/PC-based

Analysis of the state-of-the-practice

- Half of the products are built without a RE method, using Word/Excel
- 25% of the products is designed without a method, 25% by use of UML (which is not really a method)
- More than half of the products are programmed in C/C++
- 1/3 of the projects does not use test tools
- Almost all products are developed using a configuration management tool

Innovation opportunities

- Real-time specific tools score well, but are hardly used. Making RT specific tools more mature might be interesting
- Method or tool support not common for RE and Design. Those seem the most promising improvement areas for embedded systems
- Introduction of embedded test tooling, integrated with HW test tooling: potential improvement area
- Integration of technologies continues to be a large opportunity. It appears to be, however, highly context dependent and therefore requires tailoring

Analysis of the state-of-the-practice

- Legacy in technologies is leading
  - Time-pressure in project does not leave time for new things
- Risks for new technology introduction are too high
  - Complexity of new technologies (learning investment) is high
  - Immaturity of early releases of new technology
  - Benefits of technologies are not clear upfront, guarantees are not given
  - Experiences or measurements are hardly available
- Deployment is the major challenge for real industrial innovation!

Minimal Change, Maximum Result

- Industrial projects do not allow rigorous changes
- Market pressure, risk limitation, limited guarantees and inaccessible experiences reduce the motivation for major innovations
- However, problems and improvement needs exist
- So: change daily practice as little as possible, but create as much results as possible
- Local innovation by local deployment of ‘proven’ technologies
- Minimal change, maximum result
- Validated in all the industrial case experiences

Conclusions

- Large gap between available and industry used technologies
- Industry acts conservative towards SE technologies
  - Often no methods used
  - Mainly generic tools used
  - Proven technology is used at low risk
  - Pragmatic approaches
- Deployment is the major challenge for real industrial innovation!
- Request for ‘Minimal changes with maximal results’ - strategy is re-emphasized
  - Not a radical change strategy towards innovation
  - Incremental change strategy towards innovation
- The MOOSE project results support this strategy

Antwoorden?

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Thank you for your attention

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http://www.mooseproject.org/